

CLAIMS

What is claimed is:

- 1 1. A method, comprising:
2 slicing a block of data into a plurality of data slices;
3 appending slice headers to each of the plurality of data slices; and
4 scheduling the plurality of data slices for transmission onto an optical switching
5 network during fixed time slots defined on a per carrier wavelength basis.

- 1 2. The method of claim 1 wherein the block of data comprises a data stream
2 received from another network and which is buffered at an edge node of the optical
3 switching network.

- 1 3. The method of claim 2 wherein the slice headers each include a fragment
2 identifier (“ID”) indicating an order of each of the plurality of data slices and a data
3 stream ID identifying the data stream from a plurality of other data streams.

- 1 4. The method of claim 3, further comprising:
2 transmitting the plurality of data slices onto the optical switching network as an
3 optical burst, the optical burst including fixed length cells containing the plurality of data
4 slices with the slice headers appended thereto.

1 5. The method of claim 4 wherein each of the fixed length cells includes N data
2 slices of the plurality of data slices, where N is a whole number greater than one.

1 6. The method of claim 4, further comprising appending a burst header to a first
2 one of the plurality of data slices.

1 7. The method of claim 3 wherein scheduling each of the plurality of data slices
2 for transmission onto an optical switching network comprises scheduling the plurality of
3 data slices into multiple optical bursts, the plurality of data slices to be reassembled via
4 the slice headers.

1 8. The method of claim 7 wherein each of the plurality of optical bursts are
2 transmitted on different carrier wavelengths.

1 9. The method of claim 8 wherein the fixed time slots are of constant length
2 throughout the optical switching network for optical bursts transmitted on a single one of
3 the carrier wavelengths, but vary in length between the different carrier wavelengths.

1 10. The method of claim 1, further comprising:
2 establishing optical paths through the optical network prior to scheduling the
3 plurality of data slices for transmission, wherein establishing the optical paths and
4 scheduling the plurality of data slices are independent of each other.

1 11. The method of claim 10, wherein establishing the optical paths comprises
2 executing a Resource Reservation Protocol—Traffic Engineering (“RSVP-TE”) signaling
3 protocol, wherein the RSVP-TE signaling protocol includes a hybrid OBS network
4 extension.

1 12. A machine-accessible medium that provides instructions that, if executed by a
2 machine, will cause the machine to perform operations comprising:
3 slicing data blocks into data slices;
4 generating slice headers to append to each of the data slices; and
5 scheduling the data slices for transmission onto an optical switching network
6 within optical bursts, the optical bursts formed of the fixed length optical cells.

1 13. The machine-accessible medium of claim 12 wherein scheduling the data
2 slices is independent of establishing a path across the optical switching network.

1 14. The machine-accessible medium of claim 13, further providing instructions
2 that, if executed by the machine, will cause the machine to perform further operations,
3 comprising buffering data streams received from another network to generate the data
4 blocks.

1 15. The machine-accessible medium of claim 14 wherein scheduling the data
2 slices for transmission comprises scheduling the data slices from multiple ones of the
3 data streams into one of the optical bursts based on a scheduling algorithm.

1 16. The machine-accessible medium of claim 14, further providing instructions
2 that, if executed by the machine, will cause the machine to perform further operations,
3 comprising generating fragment identifiers (“IDs”) identifying an order of the data slices
4 and data stream IDs identifying the data blocks from which the data slices were sliced,
5 wherein each one of the slice headers includes one of the fragment IDs and one of the
6 data stream IDs.

1 17. The machine-accessible medium of claim 12 wherein scheduling the data
2 slice for transmission comprises scheduling a set number of the data slices into each of
3 the fixed length optical cells to be transmitted on a first carrier wavelength and
4 scheduling a different number of the data slices into each of the fixed length optical cells
5 to be transmitted on a second carrier wavelength.

1 18. The machine-accessible medium of claim 12, further providing instructions
2 that, if executed by the machine, will cause the machine to perform further operations,
3 comprising:
4 generating burst headers for each of the optical bursts; and
5 appending one of the burst headers to a first one of the data slices in each of the
6 optical bursts.

1 19. An edge node of an optical switching network, comprising:
2 a stream slicer to slice a data block into data slices;

3 a header pre-append block communicatively coupled to receive the data slices
4 from the stream slicer and to append a slice header to each of the data slices;
5 a scheduler coupled to schedule the data slices into fixed length time slots; and
6 a burst transmit block coupled to generate on optical burst for transmission onto
7 the optical switching network, the optical burst to include the data slices with the
8 appended slice headers.

1 20. The edge node of claim 19 wherein the scheduler schedules the data slices
2 independently of a signaling protocol used to establish paths across the optical switching
3 network.

1 21. The edge node of claim 20 wherein the burst transmit block is further coupled
2 to generate the optical burst as a series of fixed length optical cells, each of the optical
3 cells containing a fixed number of the data slices and appended slice headers.

1 22. The edge node of claim 21 wherein the scheduler is further to schedule the
2 data slices into multiple optical bursts according to a scheduling algorithm for
3 transmission on different carrier wavelengths through the optical switching network.

1 23. The edge node of claim 19, further comprising a buffer communicatively
2 coupled to the stream slicer, the buffer to receive data streams from another network and
3 buffer the data streams as the data blocks.

1 24. The edge node of claim 19, wherein the header pre-append block is further
2 coupled to generate a fragment identifier ("ID") and a data stream ID for each of the data
3 slices, the slice header comprising the fragment ID and the stream ID.

1 25. A system, comprising:
2 an edge node to receive data streams from a first network, the edge node
3 comprising:
4 a stream slicer to slice the data streams into data slices;
5 a header pre-append block to append a slice header to each of the data
6 slices;
7 a scheduler to schedule the data slices for transmission within fixed length
8 optical cells; and
9 a burst transmit block to generate optical bursts containing the fixed length
10 optical cells, the fixed length optical cells to be transmitted during regular
11 time slots; and
12 a egress node optically coupled to receive the optical bursts and to deliver the data
13 streams to a second network; and
14 a plurality of switching nodes optically coupled between the edge node and the
15 egress node to route the data streams from the edge node to the egress node.

1 26. The system of claim 25 wherein the scheduler schedules the data slices
2 independently of a signaling protocol used to establish a path across the plurality of
3 switching nodes.

1 27. The system of claim 26 wherein the scheduler is further to schedule the data
2 slices from one of the data streams into multiple ones of the optical bursts according to a
3 scheduling algorithm for transmission to the egress node, each of the optical bursts
4 transmitted to be transmitted on a different carrier wavelength.

1 28. The system of claim 25 wherein the header pre-append block is further to
2 generate a fragment identifier ("ID") and a data stream ID for each of the data slices, and
3 wherein the slice header comprises the fragment ID and the stream ID.

1 29. The system of claim 28 wherein the egress node is further to reassemble the
2 data slices of one of the data streams prior to delivering the one of the data streams to the
3 second network, if the data slices arrive at the egress node out of order.